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SPATIO - TEMPORAL DISTRIBUTION OF HIV/AIDS INFECTIONS IN ILORIN METROPOLIS, KWARA STATE, NIGERIA

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ABSTRACT

Understanding the epidemiology of HIV/AIDS in Ilorin metropolis is an issue of concern. Ameliorating this concern, the study examined certain objectives which are, to examine: the rate of HIV/AIDS infection in the metropolis; the demographic structure and characteristics of AIDS patients; the spatial distribution of the epidemic; as well as, evaluating the relationship between religion and spread of the infection in Ilorin metropolis. However, Secondary data collected from the University of Ilorin Teaching Hospital (UITH) were used. From these, an 8 year record consisting of 443 HIV/AIDS patients attached to the metropolis was studied. These were later analyzed using descriptive as well as inferential statistics. Thus, the result shows that females (63.2%) were more infected than the males (36.8%). Apart from this, those unmarried (singles) are less infected (32.5%), than the married (67.5%). Also, the non-civil servants (i.e. traders, artisans etc.) constitute the largest proportion (72.7%) of patients in the metropolis, from which majority (73.6%) are between ages 21-49 years. Also, education was found to exert significant influence on rate of infection, while the highest number of new cases (123 (27.8%) was recorded in year 2010. Sabon Geri ward II recorded the highest cases, while the least infected is Oju-ekun ward. In conclusion, the disease is found to be spatially inclined, coupled with the significant influence of age at first intercourse on exposure. It is recommended that, the government (at all levels) and relevant NGOs should accelerate policies and programmes development to reduce and ultimately eliminating HIV/AIDS infections in Ilorin.

Keywords: HIV/AIDS; Infections; Spatio-Temporal Distribution, Ilorin Metropolis.

INTRODUCTION

One of the most significant health and social problems ravaging the world today is Acquired immunodeficiency syndrome (AIDS) Sukran *et al*., (2012). Globally, the HIV/AIDS pandemic has led to 30 million AIDS-related deaths since the epidemic began, 76 % of which were said to have occurred in Sub-Saharan Africa (UNAIDS, 2010). Additionally in 2008, 33.4 million people were said to be living with HIV in the world, and from these PLHIV (People Living with HIV/AIDS), 23 million cases occurred in Sub-Saharan Africa constituting 68% of the world's total, and with majority of all new infections traced to the developing countries (UNAIDS, 2009; USAID, 2011). In 2009, Sub-Sahara Africa accounted for an estimated 1.8 million new infections (UNAIDS, 2010). By 2011, about 3.4 million were said to be living with the virus (UNAIDS, 2012; UNDP, 2013).

Nigeria as the most populous country in Africa with an estimated population of 154.7 million (UNICEF, 2009); 168.8 million (NBS, 2012) and 195.9 million (World Population Prospects, 2019 Revision) faces the formidable task of tackling a widespread epidemic. The first case of HIV/AIDS in Nigeria was reported in 1986 following which, the epidemic has steadily grown from a prevalence of 1.8 % in 1991 to a peak of 5.8 % in 2001 from whence it took a downward turn to 5.0 % in 2003, 4.4 % in 2005 and 4.6 % in 2007 based on 2008 antenatal survey, 4.1 % in 2010, 3.4 % in 2013 and 1.4 % in derived after the Nigeria National HIV/AIDS Indicator and Impact Survey of 2019 (UNAIDS, 2004, 2019a; Odebode and Shobiyi, 2009; UNGASS, 2010; NACA, 2010, 2012; NARHS, 2013). Nigeria has the second highest number of people living with HIV (PLHIV) worldwide after South Africa. With a proportion of about 2.9 million cases, which constitutes about 9 % of the global HIV burden and 14 % of the African burden (UNGASS, 2010). The epidemic has claimed an estimated 2.99 million lives, 1.38 million males and 1.61 million females, and left approximately 2.5 million children orphaned (Federal Ministry of Health, 2009; UNICEF, 2009). The WHO report of 2009 also observed that 61 % of HIV positive people in Sub-Saharan Africa are young women (15–24 years) UNDP, (2013); and the effects of this epidemic also has a significant impact on the proximate determinants of fertility since more women than men are infected (Ntozi, 2002; Chen and Ravallion, 2008).

However, it is pertinent to note that the spread of HIV/AIDS is not limited to only adult and youth, in fact, innocent children are

infected too. For instance, 400,000 children in Nigeria are reported to be living with HIV (UNAIDS, 2013). Studies, such as that by Hueppchen *et al*, (2000) have described the presence of co-infections with other sexually transmitted infections as one of the maternal factors that increase the risk of prenatal transmission of HIV. Despite the high awareness of condom as a contraceptive measure, the use of condoms is higher among unmarried individuals than the married individuals (Akande, 1994; Adih & Alexander, 1999; Wald *et al*, 2001; Holmes, *et al*, 2004; Bankole, *et al*, 2007; Isiaka-Lawal *et al*, 2014). Women in Sub-Sahara African countries find it difficult to suggest condom use because it is seen as challenging the sexual fidelity of the male folk (Bond and Dover, 1997; Plummer *et al*, 2006; Chimbiri, 2007). A trend affirmed by Pettifor *et al*, (2009), is largely due to the socio-cultural practices such as polygamy which may increase or decrease a married person's risk of HIV infection.

Cultural expectations is also a factor in which women are culturally constrained to remain silent, suffer spousal sexual exploits, due to the intense societal pressure that sees a woman with a broken marriage as a failure and disgrace to her family (Pettifor *et al*, 2009). Kwara State as reported by FMOH, (2008); UNAIDS, (2008); Akhigbe *et al*, (2010), recorded 1.8 % prevalence of this infection in 2008. Also, a higher urban prevalence than rural was peculiar in most Nigerian states. However, the prevalence of HIV/AIDS in Ilorin metropolis has become an issue of concern as the number of HIV/AIDS patients have greatly increased over the years. For instance, in 2001, 10 people were diagnosed of having the virus, it then increased to 13 in 2002, and 27 in 2003 (UITH, 2016). Moreover, the prevalence of HIV/AIDS among the infant age group in Ilorin metropolis can't also be neglected because, the number of pregnant women living with HIV/AIDS in the city has also increased (Isiaka-Lawal *et al*, 2014). For instance, between the months of April – December, 2010, a total of 160 pregnant women attending antenatal clinics at the University of Ilorin Teaching Hospital and 3 Primary Health Centers in Ilorin were diagnosed to be living with HIV/AIDS (Isiaka-Lawal *et al*, 2014; UITH, 2016).

Hence, the need for a detailed study into the occurrence of HIV/AIDS infections in Ilorin metropolis is apt, and it will be achieved under the following objectives, which are to: (i) examine the socio-demographic structure of HIV/AIDS patient in Ilorin metropolis; (ii) explain the space-time distribution as well as the rate of infection of HIV/AIDS over the years in the metropolis.

The Study Area

The study setting is Ilorin metropolis, the administrative and political headquarters of Kwara State (See Figure 1). It is one of the fast growing urban centers in Nigeria located on latitude 8^0 30^1 N of the Equator and longitude 4^0 35^1 E of the Greenwich meridian. The mean temperature is about 26.80^{0c} with five hours average daily sunshine (Raheem *et al*., 2009). The mean annual rainfall is about 125mm, while the dominant streams are Asa, Aluko, Amule, Okun and Agba respectively. The vegetation is guinea savannah interspersed by trees of different species. The situation of the city between the dry North and wet South of Nigeria gave Ilorin the apt description as the "gate way" between the North and South of Nigeria (Adedibu, 1980; Oyebanji, 2000). Ilorin, a typical traditional African city whose urban history predates colonialism falls into the category of third world cities described as reputed for their dualistic internal structure (Mabogunje, 1968; Raheem *et al*., 2009). Evidences from these studies among others, attest to the rapid and continuous growth in size of Ilorin. The city is divided into twenty traditional wards for the purpose of political administration of the city (See Figure 2).

Fig. 1. Kwara State Showing the 12 Local Government Areas
Source: Adapted from Kwara State Ministry of Lands and Housing, 2015

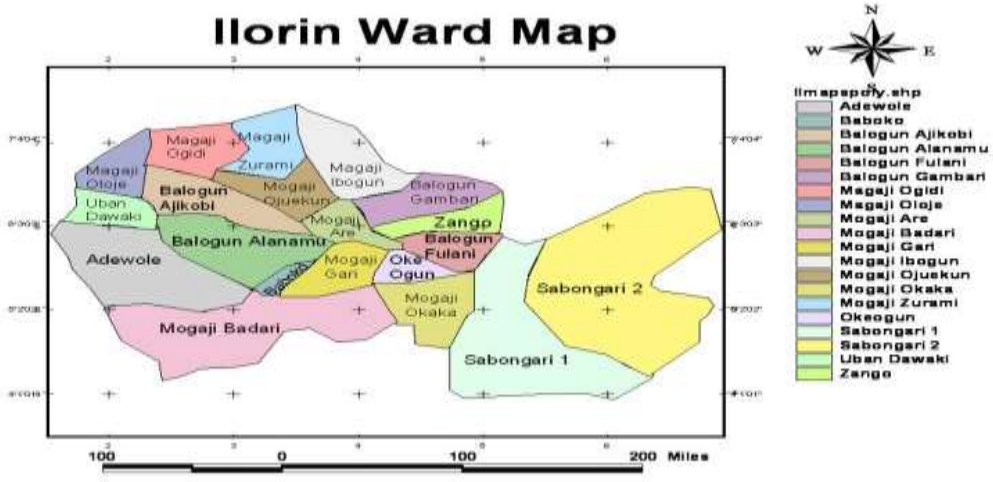

Fig. 2. Administrative Ward Map of Ilorin

It contains about 766,000 inhabitants by the year 2006 with an annual growth rate of 2.8 % (NPC, 2006), while the 2010 population of the city has been put at 855,461 based on the projection of the 2006 population census.

The indigenous people are mainly Yoruba and Hausa-Fulani. Other tribes include Hausa, Igbo, Nupe, Baruba and other ethnic groups of Nigeria. The major religions are Islam and Christianity. The occupations of the residents in Ilorin include civil ervice, commercial driving, trading, farming, artisans, organized private sector and weaving of traditional attires. The indigenous people are mainly Yoruba and Hausa-Fulani. Other tribes include Hausa, Igbo, Nupe, Baruba and other ethnic groups of Nigeria. The major religions are Islam and Christianity. The occupations of the residents in Ilorin include civil service, commercial driving, trading, farming, artisans, organized private sector and weaving of traditional attires. The indigenous people are mainly Yoruba and Hausa-Fulani. Other tribes include Hausa, Igbo, Nupe, Baruba and other ethnic groups of Nigeria. The major religions are Islam and Christianity. The occupations of the residents in Ilorin include civil service, commercial driving, trading, farming, artisans, organized private sector and weaving of traditional attires.

MATERIALS AND METHODS

Secondary data was employed in this study. This is because primary data (such as through questionnaire) might not provide adequate information needed. This is because of the fear of family discrimination and stigma stemmed from misconceptions about the HIV/AIDS, especially regarding modes of transmission (Sukran *et al*., (2012). Hence, data were collected through the records of HIV/AIDS patients from the hospital, after approval from the ethical, as well as health record and admission and discharge departments of the hospital. Owing to the peculiarity of this research, data was collected from the University of Ilorin Teaching Hospital, Ilorin. The health record store was consulted and the patient unit cards that were available were sorted out from 2008 to 2015. Hence, an eight year record of 443 patients living with HIV/AIDS attached to Ilorin metropolis were therefore analyzed, and information such as gender, age group, annual number of patients, and condition of patients were derived. Also, additional data such as marital status, religious affiliation, spatial distribution, and occupation of respondents, were derived through the assistance of the Health Record Library.

RESULTS AND DISCUSSION

Demographic and Socio-Economic Characteristics of Respondents

Table 1 shows the demographic and socio-economic characteristics of HIV/AIDS patients who are resident in the metropolis between the years 2008 to 2015, of which a total of 443 HIV/AIDS cases were recorded. From this number, 36.8 % are males while 63.2 % are females. The rationale behind the high percentage of females living with HIV/AIDS than their male counterpart especially in Nigeria and by extension Kwara State, as posited by DeSilva *et al*., (2009) is due to the fact that in many cultural believes, women suffer gender inequalities in nature and the culture creates barriers which prevent people from taken precaution especially the women. Also, women according to Awoleye and Thron (2015), are vulnerable to infections because of their role in procreation and their generally subordinate position in society. Apart from this, females are more engaged in clinical activities (especially during antenatal and postnatal cares) which makes them more vulnerable to HIV and other opportunistic infections (Mayaud and McCormick, 2001). Moreover, the females are exposed to sexual

relationships than the males, due to early marriages. Although, both sexes have been reported to experience equal exposure risks to the disease with no difference in HIV prevalence (Akhigbe *et al*, 2010).

Table 1: Demographic and Socio-Economic Characteristic of Respondents

Sex	**Frequency n= 443**	**Percentage**
Male	163	36.8
Female	280	63.2
Age Group (Years)		
0–20	43	9.7
21– 49	326	73.6
50 & Above	74	16.7
Marital Status		
Single	144	32.5
Married	299	67.5
Religion		
Christianity	122	27.5
Islam	321	72.5
Occupation		
Civil Servants	59	13.3
Non-Civil Servants	322	72.7
Student	62	14.0

Source: UITH, Ilorin, 2016.

Furthermore, reviewing the age composition of the patients' records, about 73.6 % of recorded HIV cases in the metropolis were amongst adults between the ages 21 - 49 years; while 16.7 % of cases occurred amongst the under 20s (See Table 1.1). This study is corroborated by that of Patrick and John, (2008) which reported majority of HIV/AIDS patients to be within the age range of 25-49 years. This might be based on the fact that people within this age group are more sexually active, highly migratory than other age groups which makes them more vulnerable to the disease and other STIs. Note that no age group is exempted from being infected by the HIV/AIDS virus. In addition, 67.5 % of patients are married, while the remaining (32.5 %) recorded patients were single. The reason for this might be because majority of females in Ilorin metropolis marry early. This fact has also been corroborated by Olorunfemi and Orire (2013)'s study, in Ilorin, Nigeria where age at first marriage was found to be between 20-29years. Besides, the percentage of married patients is expected to be higher than single patients because one of the modes of HIV transmission is through sexual intercourse and this enables the virus to spread among couples whose status is undisclosed or unknown. However, unlike the scenario of early entrant into a marital union noticed amongst Ilorin women, studies elsewhere in Africa reveals a divergent trend all linked to the HIV/AIDS epidemic. Scholars such as Mukiza-Gapere and Ntozi, (1995); Asiimwe-Okiror *et al*, (1997); Kamali *et al*, (2000) and Ntozi, (2002) in Uganda as well as Gregson *et al*, (1997) in Harare, Zimbabwe have all observed the effects of the disease on women's age at marriage. Young women are now delaying marriage due to fear of contracting HIV and AIDS. In addition, studies by Kaye *et al*, (2004) and Landes *et al*, (2006); have shown high prevalence of STI/HIV in women in unstable relationships. Consequently, Orubuloye *et al*, (1992) while studying Yoruba women in Nigeria, found that they were breaking off marriages, coupled with refusing sexual contacts with their spouses or having sex only by using a condom when their partner was HIV infected. In addition, the disease in 1997 is said to have orphaned about 1.5 million children in Africa, who often are at great risk of contracting HIV themselves while trying to survive (USAID, 1997; Adegoke, 2013).

Table 1 also show that 27.5 % of the patients are Christian while the remaining 72.5 % are Muslim. This cannot be farfetched from the fact that Islam and Christianity are the major religions professed by residents of city (Ahmed *et al*, 2018). Also, Ilorin metropolis has a dominant Muslim population which exerts tremendous influence on the socio-cultural and demographic attributes of its people. Besides, the Islamic faith permits polygamy, which might be one of the reasons for their large number in the metropolis. For instance, an infected sufferer (through non sexual means) stands the risk of transmitting the virus to his wives even if such a man did not commit adultery. Furthermore, 13.3 % of the patient are civil servants, 72.7 % non-civil servants (who could be artisans, farmers, traditional weavers, commercial drivers and traders among other occupations of residents of Ilorin), while 14 % are students. Civil servants and students recorded the least rate of infection of HIV/AIDS. Perhaps this will be attributed to be a result of

enhanced level of education as well as awareness of the virus. However, Agaba *et al*, (2014) affirmed that civil servants especially those receiving treatment for HIV had the highest percentage of late presenters (88.3 %) as well as 66.1 % of those with advanced HIV disease (AHD). This according to Owolabi *et al*, (2012) could be as a result of the fear of job loss, coupled with stigmatization in the event of disclosure. Hence, this high prevalence of HIV/AIDS amongst young people therefore profoundly disrupts the societal economy which will in turn affect the labour supply and national productivity (Adegoke, 2013).

Temporal Distribution of HIV/AIDS Patients in Ilorin Metropolis (2008-2015)

Nigeria is said to have a generalized HIV epidemic, but with widely varied prevalence across states and location (FMOH, 2009, 2010; Bashorun *et al*, 2014). The North-central geographical zone which Kwara State is situated, had the highest concentration of HIV prevalence rate of 7.5 %; while the state recorded a prevalence of 2.2 %, according to the 2013 Nigeria Demographic and Health Survey (NPC, 2014). Figure 3 reveals that of the 443 recorded HIV/AIDS cases within the eight year period, 1.8 % was recorded in 2008 which constitutes the lowest annual record of reported cases in the Metropolis.

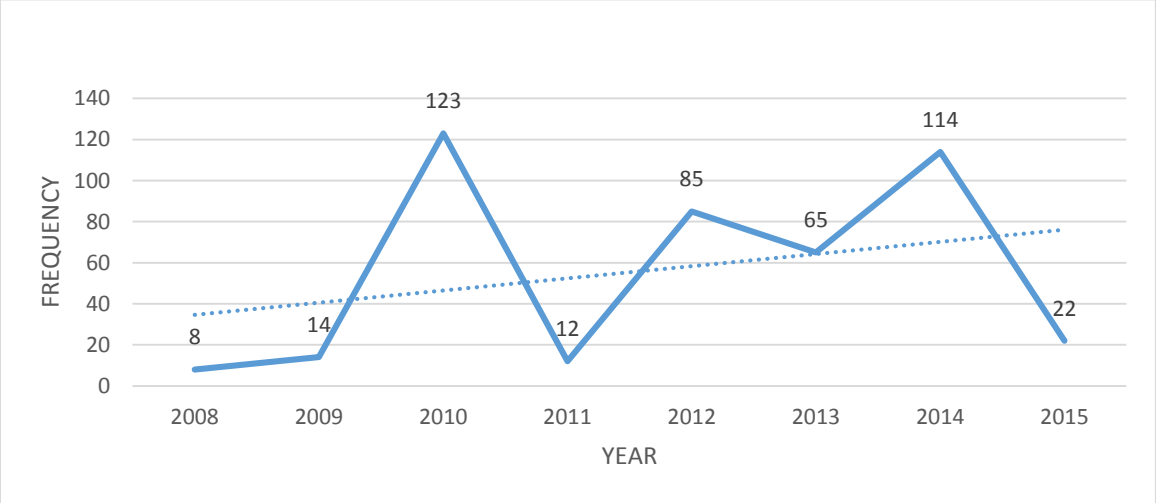

Fig. 3: Temporal Distribution of HIV/AIDS Patients in Ilorin Metropolis (2008-2015)
Source: UITH, 2016.

Thus, highest percentage of HIV/AIDS patients (27.77 %) was recorded in the year 2010. It is observed that there was no year without a reported case of HIV/AIDS, and not forgetting an increasing trend in the number of reported cases over time in the metropolis. This calls for enhanced awareness creation about the cause, mode of transmission, adequate HIV, sex and sexuality education especially amongst young pupils (UNAIDS, 2017), as well as preventive support programs in ameliorating the scourge amongst residents in general.

Spatial Distribution of HIV/AIDS Respondents from 2008 – 2015 in Ilorin Metropolis

The occurrence of HIV/AIDS was first discovered in Ilorin metropolis from a 24year old electrician, who resided at Ipata market area within the *Sabon Geri* I ward in the year 1995. Since then, the virus has rapidly spread throughout the twenty political wards in metropolis. Hence, the spatial spread of recorded cases of HIV/AIDS, also referred to as 'PLHIV' patient in Ilorin metropolis from 2008 to 2015 is under listed in Table 2. The table identified that 22.6 % of the PLHIV recorded cases were resident in *Sabon Geri* I & II and this constituted the largest proportion of cases amongst the wards.

Table 2: Spatial Distribution of HIV/AIDS Patients by wards from in Ilorin Metropolis

WARDS	NUMBER OF CASES	PERCENTAGE
Oloje	18	4.06
Ogidi	5	1.13
Zarumi	5	1.13
Ibagun	22	4.97
Oju-ekun	4	0.90
Ajikobi	19	4.29
Adewole	25	5.64
Alanamu	34	7.67
Badari	11	2.48
Baboko	10	2.26
Mogaji Ngeri	16	3.61
Okaka	36	8.13
Sabon Geri I	30	6.77
Sabon Geri II	70	15.80
Gambari	8	1.81
Mogaji Are	33	7.45
Oke-Ogun	20	4.51
Balogun Fulani	38	8.58
Zango	31	7.00
Uban Dawaki	8	1.81
TOTAL	**443**	**100.0**

Source: UITH, 2016.

Note that '*Sabon Geris'* were permanent communities of strangers segregated from the indigenous Hausa population which had existed in Northern Nigeria and other parts of West Africa long before the arrival of the British at around 1900. Over time this initially strict residential segregation broke down partially. Eventually a typical *Sabon Geri* today, would house a diversity of people from all parts of Nigeria and to a lesser extent from other parts of West Africa. This thereby justifies the high number of PLHIV in both the two *Sabon Geri* wards as depicted in Table 2. Also areas around *Balogun Fulani*, followed by *Okaka* and *Alanamu* wards recorded 8.6 %; 8.1 % and 7.7 % respectively. Note that these are locations around the indigenous areas of the city, experiencing high poverty and illiteracy levels, rampant polygamy, poor social infrastructure, not to talk of improper waste management and sanitation. Poverty especially, said to be an overarching factor increases vulnerability to, and the impact of HIV (Pascoe *et al.,* 2015); the risk of trafficking and sexual exploitation of poor young women and adolescent girls is also higher (UNAIDS, 2015; 2019b). However, the least reported cases were found in *Oju-Ekun* (0.9 %); *Zarumi* (1.13 %); and *Ogidi* (1.13 %) wards respectively (See Table 1.2).

CONCLUSION

It could therefore be concluded that the disease is spatially distributed throughout the twenty wards in Ilorin metropolis. Also, age of sexual debut play significant role in individual's rate of exposure to the disease. However, it is pertinent to noted that despite the awareness programmes of government agencies such as NACA, coupled with efforts from various Non-Governmental Organizations (NGOs) and donors, the epidemic of HIV/AIDS is still quite high in the metropolis. Although, the percentage of recorded dead patients in the metropolis is reduced, the reason for this reduction might be contrary to the effort of Kwara State Government on the provision of antiretroviral drugs for the patients and improvement in medical facilities in the state and the country at large.

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